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STAR WARS
WILL IT WORK?
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Race for the high ground

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In the name of defending the nation, researchers in New Mexico have destroyed a missile carcass with a beam of light. In New Jersey, they have built an electric cannon that uses in a single burst as much current as the city of Newark. At a New York Air Force base, they are trying to develop electronic eyes sensitive enough to spot nicks on warheads in the vast dark of space. It's all part of what one researcher calls "splendid defense" — President Reagan's Strategic Defense Initiative (SDI), his vision of developing a screen to protect the United States from nuclear missile attack. Critics say it is a pipe dream, one that might precipitate, not prevent, Armageddon.

This series will not try to decide between the judgments of "splendid defense" and "pipe dream." But it will explore the current state of technology of SDI and the options this now gives the US in designing its multibillion-dollar program.

What began as a seemingly offhand remark by Mr. Reagan in a 1983 speech is evolving into one of the key global issues of our time. It proposes nothing less than a complete change in the way superpowers think about nuclear weapons. It is a central force shaping relations between the United States and the Soviet Union. It perplexes, and at times peeves, America's European allies. It baffles Congress, divides scientists, and stirs the kind of passion in public more often associated with theological disputes.

"I think this offers more hope to the world than anything else," says Secretary of Defense Caspar W. Weinberger.

Scoffs IBM scientist Richard Garwin: It will require "a kind of magic spell that will turn warheads to dust."

The SDI, popularly known as "star wars," is not a search for a perfect defense. Disinvention of nuclear weapons is not possible. Neither can the United States turn itself into a giant domed stadium, the population safely inside.

SDI is instead a multibillion-dollar inquiry into the relative merits of imperfection. While a leakproof defense looks improbable, even critics concede that a screen could be built to stop some Soviet missiles. Thus the key questions related to technology and feasibility are: How well would such a system work? Could the US afford it? What are the specific options?

A close look at the President's SDI program reveals these points:

- The next 18 months will be pivotal in determining SDI's future. Members of Congress and lobbyists say they will devote full attention to the system for the first time. The Geneva arms talks may determine whether SDI research proceeds full-speed.
- Official SDI plans initially involve rockets, high-speed guns, and other kinetic-energy weapons, which depend on the energy of motion for their destructiveness. Lasers, particle beams, and other exotic weapons aren't figured to be available until the year 2005 or 2010.
- Weapons will not be the most difficult technical problem of star wars. That distinction will go to the computers, to the communications, and to other support technologies needed to knit the weapons into an effective system.
- If SDI's goal is something less than perfection, it is also something more than mere protection of individual US missile fields, the goal of earlier ballistic-missile defense programs.
- Technology alone can't make missiles obsolete. An effective defense of the US population would probably require some cuts in Soviet offensive arms, say a number of SDI officials. This brings arms control into the picture.
- Cost is emerging as a major point of contention in the SDI debate. Administration officials concede they must be able to build a shield more cheaply than the Soviets can add offensive weapons to overwhelm it. Critics and supporters

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